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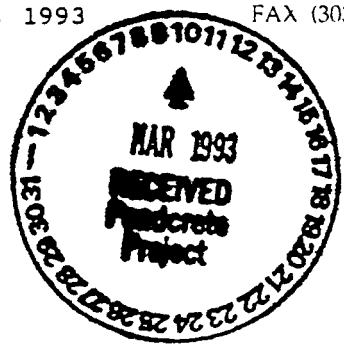
March 4, 1993



Mr. Thomas D. Beckman
Contract Technical Representative
Solar Ponds Remediation Program
EG&G Rocky Flats, Inc.
Building 080
P. O. Box 464
Golden, Colorado 80402-0464

Subject. Rocky Flats Plant Solar Evaporation Ponds Stabilization Project
[WBS 260/270 PONDCRETE/SALTCRETE TREATABILITY STUDY -
HALLIBURTON NUS ROCKY FLATS]
STATUS REPORT - BLOCK TEMPERATURE MONITORING
RF-HED-93-0155

Dear Mr. Beckman:

Enclosed for your review is a Status Report on temperature monitoring to date conducted by EG&G personnel on three blocks at the 904 Pad This monitoring commenced January 27, 1993.

Preliminary results indicate that the core temperature of existing Pondcrete/ Saltcrete blocks changes very slowly with changing ambient air temperatures Furthermore, HNUS produced blocks will have significantly less free water than existing Pondcrete/Saltcrete blocks. Thermal conductance values will be even more favorable than within the existing blocks We conclude that freeze/thaw durability should be less of a concern than previously anticipated A final report will be produced in early spring after the last freezing period to provide as much data as possible

Please contact me if you have any questions or comments.

Sincerely,

HALLIBURTON NUS CORPORATION

Ted A Bittner
Project Manager

TAB/jg

Enclosure. (STATUS REPORT ON TEMPERATURE MONITORING)

cc S Heiman
S Keith

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RF HED-93-0155

ADMIN RECORD

INTEROFFICE MEMORANDUM

DATE March 4, 1993

TO **T. A. Bittner**

FROM J H. Templeton JHT

SUBJECT Rocky Flats Solar Pond/Pondcrete Stabilization Project
Brown & Root Job No JR-1198

REFERENCE. **Status of Existing Pondcrete/Saltcrete Block Temperature Monitoring**
- In Progress -
Revision 1

INTRODUCTION

Since January 27, 1993, EG&G personnel have been monitoring the core temperatures of three existing Pondcrete/Saltcrete blocks (one pondcrete triwall, one saltcrete triwall, and one saltcrete halfcrate). The blocks are monitored at approximately four hour intervals from 8 30 a m to 11 00 p m As EG&G does not have a midnight shift at the 904 pad, no monitoring is performed from 11 00 p m to 8 30 a m Rev 1

The test blocks are inside Tent 8 on the 904 pad, each resting on the asphalt pad and with no other blocks stacked on it The blocks are situated adjacent to the tent wall, where they will be influenced by the outside air temperature more than blocks placed closer to the center of the tent This means that during the winter months, the pe imeter of the tent should be the coldest area in the tent, and was the rational for choosing this location for the temperature monitoring

OBSERVATIONS

From the initial data, the following observations were made

- It required three consecutive days of temperatures ranging between -4 and +10°F for the core temperatures of the blocks to decrease below 32°F
- Subsequently, it required two consecutive days of 30 to 49°F temperatures for the core temperatures of the blocks to increase above 32°F (actually reached 33 0°F)
- During the next cold interval it required five consecutive days where most temperatures were below 25°F, before the core temperatures of the blocks decreased from a high of 34 1°F to a low as 31 4°F
- The lowest core temperature monitored was 30 0°F
- The increase and decrease of the block core temperatures lag behind the outside air temperature by 2 to 3 days

FREEZING POINT

The 32°F temperature mentioned above is critical as it is the freezing point of water, and would indicate the freeze/thaw point for blocks containing free water The freezing point of the water in the blocks can decrease from 1 to 15°F depending on the concentration of dissolved salts in the block's contained water As our final stabilized waste will contain moderate to high quantities of dissolved salt in the free water, our critical freezing point will be between 17 and 30°F If desired, the actual freezing point can be determined by a small scale lab test using surrogate or actual waste

CONTAINED WATER

The Halliburton NUS characterization report showed that the samples taken from existing pondcrete and saltcrete blocks contain the following quantities of water

Rev

	Free Water, % *		
	Minimum	Maximum	Average
Pondcrete Trlwalls	35 8	55 2	50 9
Saltcrete Trlwalls	12 8	30 4	21 3
Saltcrete Halfcrates	17 8	25 6	21 9

* Free water as determined by Karl Fisher analyses

The blocks we will produce during both pondsludge and remix processing should contain less than 5% free water Free water is not defined as free liquid per ASTM 9095, Paint Filter Test, but rather, is the water contained but not hydrated into the pozzolan matrix Our mix recipes ensure that the water is chemically bound within the pozzolan matrix This is quite important as water conducts heat much better than cement Thus, the less free water contained within a block, the less heat it will lose to a colder temperature environment around it Conversely, the more free water contained in a block, the lower its internal temperature during winter conditions

CONCLUSIONS

- The core temperature of the existing pondcrete and saltcrete blocks changes very slowly with changing ambient air temperatures
- Extended periods of very cold weather are required for the block core temperatures to decrease below 32°F

- The freezing point of the HNUS remixed blocks will be between 17 and 30°F depending on the quantity of dissolved salt and free water contained within the block.

- The remixed blocks will be much less sensitive to cold weather than the existing blocks since they will contain much less free water

- Temperature data used for the analysis is conservative since HNUS monitored perimeter blocks adjacent to the tent wall, and the block was not located within a stack | Rev

- Contingent upon future temperature monitoring and analyses, it is relatively safe to assume that the core of the HNUS remixed blocks stored in unheated tents will undergo very few freeze/thaw cycles each winter, making product durability due to Freeze/Thaw cycling no longer a major concern for on-site storage | Rev

Additional data will be collected and all of the data will be attached to the final report, which will be issued at the conclusion of monitoring, this spring

cc: JAS/AA/Read File
JRZ/WCH/B&R Project File 835 6